

NOXIOUS TIMES

A quarterly publication of the California Interagency Noxious Weed Coordinating Committee

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Invasive Plant Concerns Highlighted during "Weed Awareness Week in Washington, DC"

BY: LARS ANDERSON, USDA-ARS

Scientists, program managers, industry representatives, and stakeholders gathered in Washington DC from February 27th to March 3rd to participate in various conferences, meetings, and to bring their concerns to House and Senate members and staffers. The goal of this event was: "To generate interest in and awareness about invasive species, and to demonstrate what is being done and what can be done to address the growing threat they pose to native ecosystems and our economy."

The week's events included a meeting of the National Governors' Association Natural Resources Standing Committee, an Aquatic Plant Management and Legislative Policy Conference, and the release by the Council for Agricultural Science and Technology (CAST) of its Issue Paper on "Invasive Plant Species." The paper was co-authored by Barbara Mullin (Chair of the committee, with the Montana Dept. of Agriculture), Lars Anderson (USDA-ARS- Exotic and Invasive Research), Joseph DiTomaso (UC Davis, Weed Science Program), Robert Eplee (USDA-APHIS), and Kurt Getsinger (US Army Engineer Research and Development Center). *It is accessible through CAST's website, <http://www.cast-science.org/index.html>*

A USDA-sponsored Seminar on Invasive Species capped the week with a panel of speakers: Bill Lyons, Secretary, California Dept. of Food and Agriculture; Dean Urmston President of the American Seed Trade Association (ASTA); Phil Weeks, Executive Vice President of The Nature Conservancy; Lynn Cornwell, President Elect of the National Cattlemen's Beef Association (NCBA); and Evelyn Slayton, representing National Garden Clubs. *For more information on "Weed Week in DC" log on at www.denix.osd.mil/denix/Public/News/OSD/NIWAW/niwaw.html* ❖

Senate Bill 1740: Newly Introduced by Senator Leslie to Combat Yellow Starthistle and Other Noxious Weeds

Senator Tim Leslie, with the sponsorship of the Regional Council of Rural Counties, introduced Senate Bill 1740 to establish a one-time 10 million dollar funding allocation to facilitate the control and local eradication of yellow starthistle. \$8 million will be distributed through County Ag Commissioner for the control of yellow star thistle. \$1 million will be earmarked for other B and C rated weeds and \$1 thousand will be allocated to state Weed Management Area support programs. The Senate Agriculture and Water Resources Committee will be hearing the bill on April 4, 2000. *For more info contact Senator Leslie's office (916) 445-5788 or the Regional Council of Rural Counties (916) 477-4806.*

A related Bill, AB737, *Noxious Weed Management* (Oller, Frusetta, House, Maldonado and Principal Senate co-author: Monteith) failed to pass out of the Assembly Agriculture Committee on January 5th, 2000, effectively eliminating the possibility that it will be heard or pass before the end of the 2-year legislative cycle this year. ❖

CINWCC Signatory Agencies and Representatives

California Agricultural Commissioners and Sealers Association

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California Department of Food and Agriculture

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California Resources Agency

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Chairwoman's Message:

Jim Shackelford, for Cheri Rohrer

NOXIOUS WEED PREVENTION - IT'S ABOUT CHANGE

While sitting in on our latest round of the Weed Free Forage and Straw Certification program, comments from the public and special interest groups have driven home a couple of thoughts that are worth sharing.

With the advent of an aggressive noxious weed prevention program, land management agencies are faced with fostering an important change in the use of public lands. When these changes occur, someone or some group is impacted. How far must an agency go to pave the road for change, and how much is enough? I don't have the answers to these questions, but maybe some ideas that will provoke some thought.

The Weed Free Forage Certification Committee has been working toward a weed free forage and straw certification program for a couple of years. Yet, at every meeting we seem to spend over half of our time bringing new groups to the table. This requires us to deal with issues that have been dealt with and closed at previous meetings. This process is frustrating, especially for those that have been there since the beginning. What went wrong? Did we not include enough special interest groups at the beginning? Did we fail in our attempt to convince our special interest groups that the program was worth their sacrifice? Is it that people just don't like change? My guess is that it may have been a little of all. How do we involve the key special interest groups at the very beginning, not just those impacted, but those that care about the resource being affected? How do we convince them that the program is worth the sacrifice, to the point where they become advocates? People don't like change. It's part of our nature. Change comes when we clearly recognize it's to our benefit to change.

The second thought is about leading by example. We can't expect the public to carry the burden of change unless we carry the torch. This will require change within our own ranks. We must do our part to clean our own equipment and vehicles if we are going to encourage or require others to do the same. We must purchase the first bales of certified weed-free hay and straw if we are going to require others to purchase it. We must expend every effort to control noxious weeds on public property if we expect our neighbors to do the same. We must talk about our successes, even the small ones.

Change is a necessary and difficult process. We will only be successful if we change the way we do business and focus on the way we interact with our publics and groups if we are going to slow the spread of noxious weeds. ♦

Noxious Times is a publication of the California Interagency Noxious Weed Coordinating Committee. The committee was formed in 1995 when 14 federal, state, and county agencies came together under a Memorandum of Understanding to coordinate the management of noxious weeds. The committee's mission is to facilitate, promote, and coordinate the establishment of an Integrated Pest Management partnership between public and private land managers toward the eradication and control of noxious weeds on federal and state lands and on private lands adjacent to public lands.

The *Noxious Times* newsletter intends to help the committee achieve its goals of coordination and exchange of information by providing land managers throughout the state with information on weed control efforts, news, and successes.

The *Noxious Times* newsletter does not specifically endorse tools, products, or other materials reported here, but rather strives to provide baseline data that will lend towards further examination and research on the part of the potential user.

Noxious Times is published quarterly by staff of the Integrated Pest Control Branch at the California Department of Food and Agriculture. We welcome submissions for our upcoming issues. Please send to: CA Department of Food and Agriculture, ATTN: Noxious Times, 1220 N Street, Room A-357, Sacramento, CA 95814 or e-mail: noxtimes@cdfa.ca.gov

If you have a colleague whose name you would like to add to our mailing list, please send mailing information to the address above.

Noxious Times Editorial Staff: Carri Benfield, Steve Schoenig, Wesley Wong, Julie Garvin, Rosie Yacoub, and Jason Harbaugh. Text written by staff unless otherwise noted.



CDFA District Biologist Profile: *Butch Kreps*

One might say that Redding East District Biologist, Butch Kreps, was *born to manage weeds*. He has seen many changes in the ways weeds have been managed over the years. Growing up on an irrigated farm in Northern Wyoming, young Butch learned about pigweed, lambsquarter, and *Setaria* while weeding pinto beans (*quarter mile rows are very long for a 7 - 8 year old little kid*). He recalls one herbicide used in the 1940's, a compound called Atlaside (*probably sodium arsinite*) which left the ground bare for several seasons. We are now using all methods of weed control (IPM). Actually "we were using IPM back in the 1940's, only the term had not yet been coined," says Kreps, "we used mechanical control (*cultivation and hand weeding*) in the beans and sugar beets, planted alfalfa or clover with our small grains, and burned our ditches and fence-rows."

A Bit of Background

Butch earned both his B.A. in Biological Education and M.S. in Agronomy (Weed Science) from University of Wyoming. While working toward his Masters degree, he was on assistantship testing the effectiveness of herbicides. He moved on to Utah State University to earn his PhD in Plant Physiology. At USU Kreps worked full time for USDA-ARS Poisonous Plant Research before coming to the California Department of Food and Agriculture (CDFA) in May of 1970.

Kreps was hired as an Associate Agricultural Biologist/Weed and Vertebrate District Biologist for the Southern California District. As a District Biologist, Kreps' main responsibility has been detection, education, and control of "A" rated noxious pests (*pests of known economic importance subject to eradication or containment by the State of California*). Except for spending nine months in 1981 working on medfly in San Jose, Butch has worked on weed and vertebrate pest management throughout his entire career. In southern California Butch split his time between vertebrate pest and weed control. Butch was transferred to the Northern District in 1976, where over the years (*due to changes in vertebrate pest control practices/regulations*) his work in vertebrate pest control decreased and was replaced by an escalation in weed control responsibilities.

Impressive list of Noxious Weed Control Projects

Kreps has been instrumental in many "A" rated noxious weed projects throughout the state. Kreps helped establish the alligatorweed (*Alternanthera philoxeroides*) project in L.A. County in 1970 and the dudaim melon (*Cucumis melo* var. *dudaim*) project in 1972. Kreps has worked on *Hydrilla* projects in San Diego, Yuba, Sutter, Calaveras, and Shasta counties since 1976. Some of the ongoing projects have included Dalmation toadflax (*Linaria genistifolia* subsp. *dalmatica*) at Big Bear and Halogeton (*Halogeton glomeratus*) in San Bernadino County. Species that Kreps has helped eradicate entirely from the state have been: Texas blueweed (*Helianthus ciliaris*) in Orange Co., and Syrian beancaper (*Zygophyllum fabago*) and camelthorn (*Alhagi pseudalhagi*) in Riverside Co. Some of the "B" pests (*pests more widespread, on a regional basis than "A" rated pests and subject to eradication, containment, or control by the County Agricultural Commissioner's Office*) like hoarycrest (*Cardaria draba*) and Russian knapweed (*Centaurea repens*) were treated in several counties during the 1970's. With additional funding in the WMA's some of these "B" and "C" are starting to be treated again. Kreps says that the "weed species that were threats" at the beginning of his career, nearly thirty years ago, are "mostly the same ones that we are working on now except for *Hydrilla* (first found in 1976 in Marysville) and some of the 'B' and 'C' weeds." Today, Butch commits nearly all of his time to noxious weed efforts, like the Shasta *Hydrilla* project. Involvement with several Weed Management Areas (WMA's) is an increasing responsibility. Additionally, Butch's time is spent supervising eight to ten seasonal employees, as well as maintaining control/survey equipment.

Three Keys to Weed Management

Kreps identifies three intertwined keys to weed management: persistence, the right tools, and continued funding. Adequate funds are necessary for persistence—going



back to a site several times/year, year after year. Additionally, when control options (tools) are limited, you must rely on funding and persistence to treat and retreat a site. According to Kreps, "several times we have had weed infestations nearly under complete control and due to reduced funding we were unable to hire seasonals and purchase herbicides. As a result, infestations spread bigger and bigger beyond the size of the original infestation."

Future Needs in Weed Control

Looking towards the future, Kreps feels that some type of "plant back" after treatment should be developed. Further research is necessary to determine what native plants will compete with and can potentially replace noxious weeds. This is especially important since we have limited herbicide tools in California. Most noxious weeds are primary invaders so when a short residual herbicide, or even worse, a short residual-nonspecific herbicide like glyphosate is used, we control not only the weed species but also the competitor species. In this case, the first plant to re-establish will be the primary invader weed. There has been some promising research using Transline to control yellow starthistle and then planting intermediate wheatgrass (*Agropyron intermedium*). Although some "purists" oppose using this non-native wheatgrass, Kreps would prefer the grass over starthistle.

A Satisfying Career

Kreps especially enjoys the diversity of the job and the really neat people with whom he works. About his career Kreps added, "I have been very fortunate. Most mornings I wake up and ask, "Boy, what do I get to do today" and this is after being on the job for nearly 30 years. ♦"

International Broom Initiative: A Comprehensive Broom and Gorse Biological Control Effort Initiated

A French Broom Biocontrol Forum was held in Santa Rosa in December 1999. The objective of the forum was to build a cooperative effort to fund research and exploration for suitable biological control agents to aid in the control of French broom in California. However, those attending the forum supported a much more extensive program to include all significant broom species and gorse. Several benefits to a multi-species approach were identified:

- (1) French broom (*Genista monspessulana*), Scotch broom (*Cytisus scoparius*), Spanish broom (*Spartium junceum*), Portuguese broom (*Cytisus multiflorus*), and gorse (*Ulex europaea*) are highly related species.
- (2) A systematic search for effective biological control agents in Europe and North Africa would be more cost effective than repeating efforts as funding becomes available for individual species.
- (3) Successful control of one broom species could leave an area open to infestation by another related exotic species.

Need for Biocontrol is Clear

French broom alone is estimated to be expanding by 4,600 acres per day in the Western United States. The seed bank in the soil commonly ranges from 30,000 to 100,000 seeds per square meter and seeds remain viable for many years. Broom and gorse threaten native plant communities, endangered species, recreational access, and water quality. Brooms present an increased fire hazard and thus are a serious threat to homes.

The decision was made to move forward towards an international cooperative effort, initiating an International

Broom Initiative (I.B.I.). The initiative proposes to cooperatively fund a comprehensive biological control effort and includes a worldwide fundraising campaign. Work would be facilitated according to a ten-year schedule.

The Process

On the International front, a cooperative research agreement between the Oregon Department of Agriculture and Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO) laboratories at Montpellier, France, would be expanded to include research efforts on French broom, Spanish broom, Portuguese Broom, and gorse. CSIRO has a long history of cooperation with the United States in biological control and has already found several promising Scotch broom biocontrol agents. Prior to release, all potential biological control agents undergo a rigorous series of host range tests. The objective is to determine if these agents negatively impact desired crop plants, ornamentals, or native species. When completed, the host range test data are summarized in a petition submitted to USDA's Animal and Plant Health Inspection Service (APHIS) and state departments of agriculture for approval. Fortunately there are few desirable or native species closely related to these broom and gorse species.

CalePPC to Serve as Funding Depository for Foreign Research Effort

The I.B.I. could potentially yield as many as three biocontrol agents per year over ten years and cost between \$190,000 and \$240,000 per year. This represents only a fraction of the cost

already being spent to control broom in California. A single depository would simplify the cooperative agreement and transfer of funds in a foreign research effort. The California Exotic Pest Plant Council (CalePPC) has offered to serve as a depository and accept donations from all interested parties and set up the necessary agreements with scientists abroad. CalePPC has the ability to receive grants and enter into contract agreements with public agencies. Donations from individuals and private organizations would be entirely tax deductible. CSIRO will cooperate with the I.B.I. committee to develop a new research budget for a comprehensive approach to biological control of the noxious broom and gorse species. A final proposal is expected by May 1, 2000. ♦

For more information contact Bill Baxter, California Department of Forestry, bill_baxter@fire.ca.gov or Mike Pitcairn, California Department of Food and Agriculture and California Exotic Pest Plant Council, mpitcairn@cdfa.ca.gov



National Fish and Wildlife Foundation Announces 2000 Award Winners

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Santa Margarita and San Luis Rey Watersheds Weed Management Area

Mission Resource Conservation District

\$32,500 NFWF, \$65,000 Challenge, \$97,500 Total

Cosumnes River Exotic Weed Management Project - II

BLM, Folsom Office

\$23,300 NFWF, \$38,820 Challenge-\$62,120 Total

Bear Creek Watershed Restoration-II

American Land Conservancy

\$50,000 NFWF, \$82,000 Challenge-\$132,000 Total

Humboldt Bay Dunes Restoration, Phase IV

Bureau of Land Management

\$40,000 NFWF, \$65,000 Challenge-\$105,000 Total

Owens Basin Collaborative Weed Outreach and Control Project

BLM, Bishop Field Office

\$50,000 NFWF, \$360,000 Challenge-\$410,000 Total

Modoc County Noxious Weed Inventory and Education Project

USDA - Forest Service

\$17,500 NFWF, \$35,000 Challenge-\$52,500 Total

Lassen County Combined Effort for Weed Control-III

BLM, Eagle Lake Field Office

\$24,800 NFWF, \$62,600 Challenge-\$90,400 Total

Drawing the Line on Yellow Starthistle in the High Sierra Nevada

CA Department of Food and Agriculture

\$27,800 NFWF, \$62,600 Challenge-\$90,400 Total

California Weed Mapping and Strategic Planning Workshop set for June 8 & 9, 2000

The California Department of Food and Agriculture, UC Davis' Information Center for the Environment, along with other agencies, will be sponsoring a workshop on the use of mapping technologies, weed ranking techniques, strategy and management planning, and environmental compliance issues in Woodland California on June 8th & 9th. This workshop is intended for Weed Management Area participants, county, state, and federal employees, students, and anyone else involved in the regional mapping and control of noxious and invasive weeds. *The schedule will be as follows:*

Day One, June 8th: *In depth demos; some hands-on;*

1) Field demonstration of a Trimble Geoexplorer GPS (Global Positioning System) – Issues covered will be a brief theory of GPS, data dictionaries, satellite availability, file management, uploading data, differential correction, and exporting data to GIS (Geographical Information System). 2) Brief introductory demonstration to ArcView GIS for building a regional weed spatial database– Issues covered will be terminology and basics of what GIS does, base maps and types of spatial data, inputting weed data, manipulating weed data, and printing maps.

Day Two, June 9th: *Lecture format*

Using and choosing GPS, intro to GIS for weeds, regional collection of weed data, using a weed GIS to set control priorities, weed triage: how to prioritize weeds, how to turn priorities into a regional strategic plan and determine key projects, how to write project management plans, what types of environmental compliance might be necessary, and how to monitor for project success.

Conference Cost: One day \$30; Both days \$50. Includes Lunch and Workshop Notebook. To register: download form from www.cdffa.ca.gov/workshop or form may be obtained by emailing sschoenig@cdffa.ca.gov. Call Steve Schoenig at (916) 654-0768 for other information.

Developing an Information and Mapping System for Invasive Weed Management



BY: EMMA UNDERWOOD

INFORMATION CENTER FOR THE ENVIRONMENT

Under the direction of Professor Jim Quinn, the Information Center for the Environment (ICE) at UC Davis has become increasingly involved with information systems to support management of invasive species. This involvement originated from a meeting at the Summit on Sustainable Development, in Santa Cruz, Bolivia in December 1996, where the Inter-American Biodiversity Information Network (IABIN) was proposed. An action plan was signed by participating governments and heads of state from countries in North, Central and South America with the mission of promoting compatible means of collection, communication, and exchange of information relevant to decision-making and education on biodiversity conservation.

PILOT PROJECT AIMS TO STANDARDIZE THE ELECTRONIC NOXIOUS WEED DESCRIPTIONS

One of the components of IABIN currently being prototyped at ICE is an Invasive Species Pilot Project for vascular plants. The premise behind this work is to improve our knowledge of current and future invasion threats by increasing access to information. To date, this has been hindered by limited data sharing, mechanisms to access databases, and gaps in knowledge. In essence, the focus of the pilot project is to develop standardized electronic descriptions; the 'who', 'what', 'when', 'where' of invasive weeds in California -- the most basic requirement for sharing data among multiple databases and organizations. There are two areas that researchers at ICE are currently

focusing on: the development of search and retrieval systems for invasive species information, and the mapping and modeling of invasive weed distributions.

ESTABLISHING A COMMON VOCABULARY

First, an important aspect to developing an information system for invasive weeds is to establish a common vocabulary and knowledge classification. This facilitates search, indexing, and retrieval of documents that are in many diverse locations. ICE is beginning to collate a thesaurus of invasive weed terminology with the help of the weed community in California. With such a thesaurus, it will be possible to catalog documents in a consistent manner and build a framework around these that allows for remote querying and access to information about weeds that is stored in a distributed manner.

DEVELOPING MAPPING METHODS AND PREDICTING POTENTIAL DISTRIBUTION

The second aim of this project is to develop methods to map and predict the potential distribution of weed species. Mapping of selective invasive weed species will be conducted on Vandenberg Air Force Base using high resolution (1m) multi-spectral imagery and a detailed GIS database. This will try both to identify selected species directly from the imagery (e.g. an advancing "front" of ice plant) and also to model the occurrence of other species by linking field work together with geophysical data such as information on soils, topographic complexity, and land-

use history. Another component is to model the potential distribution of weeds on a statewide scale, relating statewide occurrence data to environmental factors such as climate, disturbance, and vegetation type. It will use an application called Species Analyst, developed jointly by the University of Kansas Natural History Museum and the San Diego Supercomputer Center, which uses a sophisticated model to infer species distributions based on geographical information and is capable of searching distributed repositories of biodiversity information. A major aim here is to facilitate online compilation of weed observations, and easy retrieval by both experts and interested citizens.

USEFUL THROUGHOUT THE AMERICAS

The objective of ICE's work is to facilitate development of an information system that will be useful for the management of weeds not just in California, but eventually throughout the Americas. ICE would like to encourage all members of the California weed community to participate in developing these systems. ❖

For more information about the project or how you can participate in developing the systems, contact:

Jim Quinn, jfquinn@ucdavis.edu,
Emma Underwood, ecunderwood@ucdavis.edu, or Allan Hollander, adh@ice.ucdavis.edu at the Information Center for the Environment, UC Davis.

Team Arundo del Norte Receives Calfed Grant

BY: CAITLIN CORNWALL FOR TEAM ARUNDO DEL NORTE

Team Arundo del Norte has received a substantial Calfed Bay-Delta grant to coordinate Arundo eradication in the Sacramento-San Joaquin watershed.



Arundo donax, also known as Giant Cane or Giant Reed, grows in large infestations and may reach 30 feet tall.

Team Arundo del Norte (TAdN) is a multi-stakeholder partnership dedicated to the reduction and eventual elimination of *Arundo donax* where it threatens rivers, creeks and wetlands in central and northern California. The Team communicates actively in meetings and via an email listserv (tadn@ceres.ca.gov) and website (<http://ceres.ca.gov/tadn>). TAdN offers a forum for discussing current and planned research and eradication, and for identifying and discussing issues involved in addressing Arundo invasion. A wide range of geographic representation and expertise has organized within its membership. The lively, problem-solving nature of TAdN has attracted the good will and trust of Calfed agencies.

Our proposal to Calfed emphasized lessons that have been learned from experience with Arundo in Southern California streams, where there are estimated to be thousands of infested acres. Early prevention of the spread of Arundo is clearly the most cost-effective approach. In

the Bay-Delta watershed we have the advantage that Arundo is common, but does not yet dominate most riparian systems, so moderate control and restoration efforts may forestall the utterly devastating level of invasion that has changed the nature of rivers to the south.

The grant is a three-year umbrella project that would carry out Calfed's work with regard to Arundo control.

TAdN will prioritize eradication sites, advise on methods, address permitting issues, and identify opportunities for complementary projects and funding. Sonoma Ecology Center, a non-profit and founding TAdN member, will administer the grant. The cost for three years is \$818,045, matched by \$305,036 in in-kind contributions. Funding will be available no earlier than summer 2000. ♦



You can contact TAdN at tadn@ceres.ca.gov. For information about the Calfed project, contact the Sonoma Ecology Center at (707) 996-9744 or sec@vom.com

TAdN's PROJECT WILL...

1) Direct funds to "eradication partners" in six watersheds that are prepared to immediately carry out Arundo eradication. Congratulations to these partners! They are: Putah Creek (Putah Creek Council and partners), Big Chico Creek (City of Chico), Sonoma Creek (Sonoma Ecology Center), Walnut Creek and tributaries (Friends of the Creeks), Napa River (agricultural landowners), and Francisquito Creek (San Francisquito CRMP and partners) (*see map*).

2) Work with other potential eradication partners, including local groups or agencies who are planning Arundo removal projects, and sites that need Arundo control but lack a constituency. We will provide assistance with development, implementation, and monitoring of eradication plans, coordinate resources, and oversee projects. Stakeholders will be trained to do their own eradication and positioned to receive eradication funding. Outreach efforts will use educational materials recently completed by the CA Department of Fish and Game and TAdN. We will particularly encourage projects that:

- ♦ Include multiple stakeholders with significant local involvement, including volunteer and/or landowner labor
- ♦ Foster riparian health as a preventive measure against Arundo invasion or re-invasion
- ♦ Work from the top of the watershed down, accounting for Arundo's downstream direction of invasion

3) Consolidate the mass of existing Arundo-related information and make it widely available via the Internet.

Invasive Weeds and the Hort

BY: ALISON TSCHOHL

A Briefing on Invasive Nursery Stock

An estimated 5,000 introduced plant species have escaped and now exist in natural ecosystems in the U.S.¹ On average 12% of intentional introductions cause economic or environmental damage.² Most introduced species fulfill their intended role and do not interfere with natural processes, however about 10% have escaped cultivation and spread into undisturbed native habitats to establish self sustaining populations without direct human assistance. Horticultural stock is a significant source of known and potentially invasive plants. **The problems associated with invasive nursery stock fall into two broad categories: (1) the continued sale of known invaders and (2) the evaluation of new horticultural introductions which could be potentially invasive species.**

Current regulations and weed management practices mainly target the first category. In California, the regulatory scope extends only to those species which are listed on either the federal or California noxious weed lists. Many invasive plant species, especially those which primarily invade "areas not managed for economic return," are not listed. Sarah Reichard of the University of Washington estimates that at least 750 species that meet the definition of the Federal Noxious Weed Act (FNWA) remain unlisted.

No mechanism exists in the current framework for controlling the propagation, distribution, and sale of unlisted species with known invasive tendencies. Highly invasive plants like pampas grass are available in some nurseries despite the fact that land managers may cite them as a top management concern.

The second category, preventing the introduction of new potentially invasive plants is much more contentious. Within the nursery industry, a steady supply of novel plants is key to stimulating consumer interest and increasing profit margins. A good ornamental plant often has many traits that can make it a good invader. Horticulturists want plants that are easy to propagate, establish rapidly, mature early, produce abundant flowers, and are environmentally fit and free from major insect and disease pests. The demand for such plants is overwhelming - 69 million households spent \$30 billion at retail lawn and garden centers in 1998.

Current regulations do not mandate any screening process for the invasive potential of imported species. Any type of assessment procedures would necessarily slow the process of getting new plants to market and have undetermined economic impacts on the horticultural industry. The U.S. is the largest importer of nursery and greenhouse products in the world and

some believe that any screening will depress the industry and effectively halt all legal flow of new plants into the U.S., creating a black market of new plants that enter through illegal channels. Guidelines for screening incoming plants would need to be based on good science and justified by credible risk assessment.

A primary obstacle to

dealing with either category of invasives is the lack of agreement on objective criteria for what makes a plant invasive. Clearly establishing such criteria is a critical precursor to defining the issues surrounding invasive horticultural stock and taking steps toward possible solutions. The issue is not simply native vs. non-native. In the effort to quantify invasive characters, some see an opportunity to rethink current horticultural practices. Increased research on alternatives to invasive species may lead to new cultivars and breeding techniques that could actually increase numbers of new plants and diversify nursery stock.

The Horticulture Industry Up Close

Escaped ornamental plants undoubtedly impact agricultural and natural areas and cost governments millions of dollars annually. Consequently, the horticulture industry is a major stakeholder in the effort to control invasive plants. According to the USDA Economic Research Service (ERS) the environmental horticulture and floriculture industry, including greenhouse, turfgrass, and nursery related crops, is the fastest growing sector of US agriculture. In 1997, the industry ranked seventh in cash receipts of all commodities with \$10.9 billion in sales. California alone generates 20% of the total nursery crop production, followed by Florida (11%), North Carolina and Texas (8%).

The nursery industry is predominately comprised of small, independent operations in which growers directly market their nursery stock. In California, all grower and retail nurseries require a license from the California Department of Food and Agriculture (CDFA) for each location where plants are grown or held for sale. Each year CDFA licenses 3,500 grower nurseries, 3,000 retail nurseries, and 3,500 "incidental dealers" such as supermarkets, drug chains, and big box stores. In 1998, the California industry generated \$2.4 billion.



Pampas grass, an aggressive coastal invader (seen here growing in containers) being sold at a wholesale nursery in Southern California.

Horticulture Trade

Levels of awareness about invasive nursery stock vary by region and within different facets of the horticulture industry. Horticulturists are quick to point out the regional nature of weed problems and are strongly opposed to statewide or national bans on most plant species. Many weeds have restricted distributions that make them problematic only in particular settings. Instituting local restrictions on plants in areas where they are known to invade would minimize economic impacts to the industry. A regional approach is also suited to the current regulatory framework in California which emphasizes management at the county level.

The industry generally favors voluntary guidelines for controlling the spread of invasive species. The threat of nationwide bans, which could pose a significant economic impact, provides a strong incentive for the industry to self regulate and avoid federal or state legislation. Nationwide mandates would require governmental enforcement and may not be perceived as fair. In contrast, voluntary guidelines, paired with a rigorous education campaign, could promote a high level of awareness of the problem. Establishing voluntary guidelines at an academic level would require input from industry, cooperative extension, and government agencies.

inspections, implements plant or pest quarantines, and carries out control plans. Only plants listed on the Federal Noxious Weed list or with a CDFA noxious weed rating are subject to any actions by the CAC. In contrast, other states conduct centralized inspections and quarantines through the main office of the state Department of Agriculture.

The CDFA weed designations of A, B, C, D, or Q have no legal standing, but are policy and regulatory guidelines which indicate different possible actions. Nurseries must be completely free of A and B-rated pests. CDFA seeks to totally eradicate A-rated pests in all occurrences but takes action against B-rated pests only when found in a nursery. Actions against B-rated pests in non-nursery locations are at the discretion of the local CAC. C-rated pests are not subject to state action and may be tolerated in nurseries at the discretion of each CAC. Decisions are generally based on the distribution of the species and whether an active control or eradication program is in place in that county. CAC's may choose to institute more aggressive actions against listed species within their county on a case-by-case basis. In California, any person can petition to have a plant listed as a noxious weed. CDFA will review all available information on the species and consult with agricultural interests and CAC's

Horticulture Trade
continued on page 12...

What are the Rules Now? Complexities of the Regulatory Framework

California has a unique and somewhat complicated regulatory system for the nursery industry. The California Agricultural Commissioner (CAC) system locally enforces mandates of CDFA and oversees aspects of the agricultural sector including pest prevention, plant quarantine, noxious weed control, and nursery stock and seed inspection. All 58 counties have a CAC which addresses local weed and pest problems and sets guidelines for nursery cleanliness standards. Each CAC conducts nursery

What Is, and Can Be Done About Invasive Species Being Sold in Nurseries?

■ Local Weed Management Areas, the California Exotic Pest Plant Council (www.caleppc.org), and the California Native Plant Society are all beginning to take concrete actions to educate local nursery management.

■ Members of California Association of Nurserymen are working with the County Agricultural Commissioners and Sealers Association (CACASA) to develop voluntary restrictions on the production, distribution, and sale of many different invasive species and to develop a new set of guidelines for retailers and growers that address invasive characteristics.

■ The CACASA formed an Invasive Nursery Stock Subcommittee to educate Agricultural Commissioners about problem plants in their area and share responsibility with the California Association of Nurserymen to educate nursery retailers and growers. The goal is to prevent the spread of existing invaders by discouraging their use as ornamentals and replacing them with non-invasive alternatives.

■ CACASA submitted 13 plants to the CDFA's Pest Ratings Evaluation Committee to be considered for a pest rating and included on the noxious weed list.

■ The American Nursery and Landscape Association is working with the Horticultural Research Institute on developing guidelines for weed risk assessment.

■ The National Plant Board has conducted a Safeguarding Review of current pest exclusion practices of the Animal Plant Health and Inspection Service of USDA, which regulates nursery stock coming into the country. The full report and recommendations are available at www.aphis.usda.gov/ppq/safeguarding/

■ Last year the Florida Nurseryman and Growers Association cooperated with the Florida Exotic Pest Plant Council to phase out production of 11 commercially grown invasive plant species. Read the press release at <http://tncweeds.ucdavis.edu/news/051899.html>

■ The Australians provide a good example of industry and government working together to address invasive garden plants in their national program called "Garden Plants Under the Spotlight". The program emphasizes development of educational packages and marketing strategies geared toward adopting voluntary guidelines. The assumption is that voluntary steps are the best way to instill a commitment to prevent the spread of invasives, whereas mandatory regulation without associated education will produce resistance and may not be perceived as fair.

Profile

BY: RAY CARRUTHERS

Weed Control and Exotic and Invasive Weeds

The USDA–Agricultural Research Service Exotic and Invasive Weeds Research Unit (EIWRU) is expanding again. A new scientist is now being recruited to enhance cooperative weed management activities in the Western States with continued emphasis on yellow starthistle (YST), and new activity on Russian thistle and medusahead rye.



Water Hyacinth

The new scientist will join the EIWRU team at their Albany worksite where she/he will concentrate on the development of new biological control technologies. In addition to the new scientist, the unit now has 7 other Category I Scientists, 2 Support Scientists, 1 Postdoctoral Associate, 8 Technical Support Staff and Clerical Associates. The program personnel are distributed between three different worksites, Albany and Davis, CA and Reno, NV. At these three locations, the EIWRU team works cooperatively among themselves and with a number of State, Federal and private cooperators to address a range of important agricultural and environmental issues associated with invasive weed management.

Range Ecology Lab Reno, Nevada

In Reno, emphasis is now being placed on a number of key projects including the effect of

invasive grasses (especially *Bromus spp.* and medusahead rye) on fire and range management, the biology and control of perennial pepperweed, establishment biology of native riparian species such as willows and cottonwood, and the effects of small mammals and other factors in



Medusahead

the revegetation ecology of important native grasses and other beneficial plant species. This and other research is being lead by Dr. Bob Blank (Soil Scientist), Dr. Bill Longland (Ecologist) and Dr. James Young (Rangeland Scientist). Dr. Blank specializes in investigating plant–soil relationships and seedbed ecology, fire ecology and on the effects of fire on soil properties that affect seed and seedling development, and on soil erosion and genesis in temperate deserts. He operates a soil and plant analysis laboratory. Dr. Longland researches the genetics and population ecology of invasive weeds on Great Basin rangelands, such as cheatgrass (*Bromus tectorum*) and saltcedar (*Tamarix spp.*). The goal of his research is to understand how the activities of native fauna may enhance or inhibit the productivity of desirable or undesirable plant species. This includes research aimed at manipulating seed caching and seed consumption by these animals in a manner that increases the number of seedlings that emerge from seed caches or from reseeded rangelands. These results may be used for revegetating disturbances such as burned or mined areas. Dr. Young is an outstanding Range Scientist with over 400 publications

on many different aspects of rangeland management including several excellent articles on the biology and control of invasive weed species. Jim is currently working with Charlie Clements (Range Scientist) to assess the biology of various invasive weed species such as cheatgrass, medusahead rye (*Taeniatherum caput-medusae*) and perennial pepperweed (*Lepidium latifolium*). Dr. Young also oversees the operation of a native seed lab in Reno where detailed germination characteristics have been developed for many difficult to grow native plant species.

Aquatic Weed Management Lab Davis, California



Hydrilla

The Davis Location specializes in the management of aquatic weeds such as water hyacinth, Eurasian watermilfoil, *Egeria densa*, *Spartina sp.* and others. Dr. Lars Anderson (Plant Physiologist) leads activities on development of cost-

effective herbicide application systems for management of *Egeria densa* in tidal water of the Sacramento–San Joaquin Delta, genetic characterization (via RAPDs and chemical taxonomy) of *Myriophyllum spp.*, and gene expression relative to tuber formation in *Hydrilla verticillata* and *Potamogeton nodosus*. He is also a key team member of the group recently funded by CalFed to develop

and the USDA Weeds Research Unit



Agricultural
Research
Service

new management tactics for control of *Spartina* in San Francisco Bay. Dr. Anderson is commonly sought out by others as both a research cooperator and project consultant. For example, this past December Lars traveled to Australia where he was an advisor to the International Olympic Organizing Committee on aquatic plant management in the area to be used for rowing competition in the next summer games. Dr. David Spencer (Ecologist), also of the Davis EIWRU worksite, specializes in new approaches to aquatic plant management through developing an understanding of reproductive ecology of weedy aquatic plants such as Pondweeds (*Potamogeton spp.*), Eurasian watermilfoil (*Myriophyllum spicatum*), and *Hydrilla*, conducting studies on competitive interactions between exotic and native species, characterizing defense chemistry and resource allocation in invasive weeds. Using these data he constructs and evaluates detailed phenology models of weed growth, development, and control technologies, such as a current study of Eurasian watermilfoil in California flowing and lentic habitat phenologies. Dave is expanding his efforts to the semi-aquatic/terrestrial environment by taking on the large task of conducting growth and developmental studies for *Arundo donax*, the highly invasive giant reed. This entails modeling spatial/seasonal variation in growth and tissue characteristics such as nutrients and defense chemicals. In addition, Dr. Spencer is working with Dr. Carruthers at Albany, to develop and apply new GIS and computer modeling technologies for various weed species and their insect natural enemies. We hope that these tools

will be useful in both assessing natural enemy effectiveness prior to release and in helping to assess and manage invasive weeds and their natural enemies in the field.

Biological Quarantine Facility at Western Regional Research Center Albany, California

In Albany, the EIWRU is in the process of revitalizing the Biological Control of Weed Quarantine Facility and the

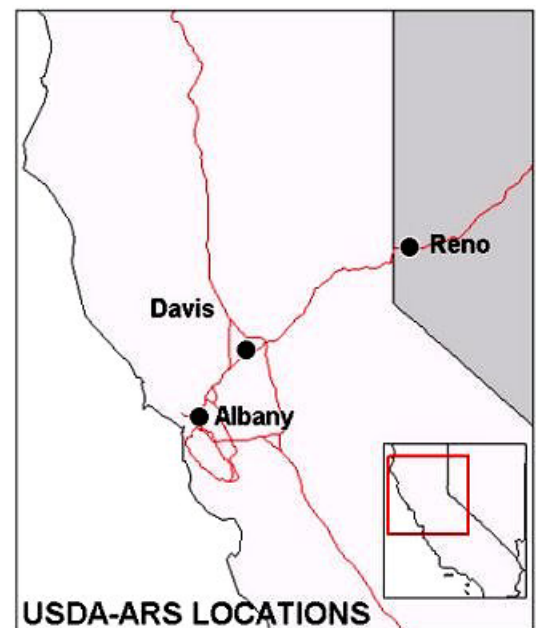


Yellow starthistle seedhead weevil

associated evaluation of weed biological control agents. Dr. James Seiber, the new Director of the Western Regional Research Center, is assisting the EIWRU in making facility improvements and in gaining additional interagency cooperation in the program. Dr. Seiber who was a past Associate Dean for Research at UC Davis and most recently the Director of the University Center for Environmental Sciences and Engineering at the University of Nevada, Reno, is a strong advocate of invasive species management and is helping to further strengthen the EIWRU program at all three worksites. Through this strengthening process, USDA-APHIS has recently hired a new Quarantine Officer and Entomologist (Dr. Nada Carruthers), to oversee quarantine operations at the Albany facility. Nada has helped

to reorganize the Albany Quarantine and in addition is conducting a number of biological studies on various biological control agents of yellow starthistle. Although only on the job for about 6 months, the quarantine facility is approaching top working order. Dr. Joe Balciunas is continuing his efforts to identify new natural enemies of YST, Scotch thistle, and Cape Ivy, and to conduct field studies to help determine the impact of previously released agents affecting YST. Most recently, Dr. Balciunas just returned from South Africa where he was involved in conducting foreign exploration for new Cape Ivy natural enemies and in overseeing cooperator's investigations on this important project. Joe expects that new Cape Ivy insects will be coming into the quarantine sometime later this year. Dr. Ray Carruthers (Ecologist) and John Herr (Entomologist) are working cooperatively with Dr. Tom

Profile Continued on next page...



Exotic and Invasive Weeds Research Unit



Profile *continued from page 11...*

Dudley of UC Berkeley, Dr. Jack DeLoach (ARS, Temple, TX) and others, on the biological control of *Tamarix spp.* using a leaf beetle, *Diorhabda elongata*, originally cleared through the ARS Quarantine in Temple. The leaf beetle has now been released into field cages in six western states where basic biology, plant impact assessment and potential non-target feeding are being assessed. In California, field cage tests are underway in both Inyo and Monterey Counties. If all field cage tests are positive, the leaf beetles are expected to be released



Quarantine operations at the Albany Facility

into the environment later this summer. In cooperation with scientists at the ARS laboratories in Temple, TX and Montpellier, France, additional *Tamarix* natural enemies

are now being permitted to enter the Albany Quarantine this spring. Additional foreign exploration for natural enemies of *Tamarix* is continuing with overseas cooperators and is just beginning for *Arundo donax*. ❖

For more information on the Exotic Invasive Weed Research Unit please check out the unit web sites:

- <http://wric.ucdavis.edu/exotic/exotic.htm>
- <http://www.pw.usda.gov>

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before making a decision.

At the federal level, significant risk must be demonstrated before action is taken to list a species. The FNWA pertains to species that “are of foreign origin and are new or not widely prevalent in the United States.” Current interpretation of the act restricts the authority that the Animal Plant Health Inspection Service (APHIS) has to regulate interstate movement of noxious weeds other than those for which a control/eradication program is in place. Agricultural pest plants that attack high value crops and impact other economically important productions have been the main targets of the Act.

Several loopholes exist in the current regulatory framework. Noxious weeds may be trafficked through undocumented channels, especially aquatic plants. According to Ed Meyer, Contra Costa County Agricultural Commissioner, CAC’s routinely find listed species such as giant salvinia in pet stores and aquatic shops during inspections. A County Ag office may go through the sales records and reach the wholesaler to stop selling the plant, only to find it again at a later time,

sold back to the shop from a private individual. Often these “backyard propagators” are unaware that the species is a problem.

Internet sales of nursery stock are another avenue of spread of both listed and unlisted invasives. Many known invaders are available on garden product websites that will ship anywhere in the country. Faith Campbell of the American Lands Alliance compiled a list of 452 “worst invasive plant species in the conterminous US” and found that 271 species or 60% were for sale through Andersen’s Horticultural Library. Disagreement exists as to the number of invasive plants that are currently available for sale, but there is a general consensus that the proportion of invasive ornamentals is low and that invaders occupy a small share of the total market. It is necessary for the horticulture industry to share the responsibility of preventing the spread of existing invaders by discouraging their use in landscape settings and offering non-invasive alternatives. ❖



This advertisement selling purple loosestrife, originally from a 1950s Ladies Home Journal was archived at the California Department of Food and Agriculture Plant Pest Diagnostic Center. Escaped ornamental plantings from home gardens is one source of rampant spread of invasives across the United States. Today, with many invasives available for sale on the internet, nationwide distribution has become even more of a threat.

REFERENCES:

- ¹Pimentel. 1999. Environmental and Economic Costs Associated with Non-indigenous Species in the United States. www.news.cornell.edu/releases/Jan99/species_costs.html.
- ²United States Congress, Office of Technology Assessment. 1993. Harmful Non-indigenous Species in the U.S. OTA-F-565. U.S. Government Printing Office, Washington, D.C.

This article was contributed by Alison Tschohl, a graduate student who is currently finishing up with her Master's Program in the Horticulture Graduate Group, Weed Science Program, at the University of California at Davis, aetschohl@ucdavis.edu.



TOOL BOX:

Flaming - A *Hot* Weed Control Method

TOOL BOX highlights new tools that might integrate well into local weed management tool boxes. Noxious Times does not specifically endorse tools featured, but rather strives to provide baseline data that will lend towards further examination and research on the part of the user.

Description: Flaming was a popular method of weed control before the existence of many chemical herbicides; and is experiencing a comeback in agriculture today. It involves using a gas torch to pass intense heat over the leafy parts of a plant. The heat causes the cell walls to burst, killing the plant. This doesn't burn the weeds—it wilts them. Flaming has some advantages over other kinds of weed control. Unlike herbicides, flaming can be used on young, emerging weeds without affecting established, desirable plants, and it leaves no residues. And unlike mechanical or manual cultivation, flaming will not bring other weed seeds to the soil surface.

Flamers come in many shapes and sizes. For large areas, there are tractor and truck rigs. In row crops, flamer rigs traveling up to 5 miles per hour have been effective in weed control. For smaller areas, or spot treatments, hand held and backpack setups are available. Things to take into consideration when purchasing a unit or system are: the BTUs put out by the torch itself, the size of the flame, and the type of fuel to be used. Generally speaking, the hotter the flame, the better, but you may want to get some advice about what sort of heat is right for your application. The volume of flame will make a difference as to what size plant a torch can affect.

Different Systems: Backpack and hand-held systems are most commonly sold with gas vapor torches. Because of the relationship between volume, pressure and temperature of gases, propane can freeze in a tank that is used continually without regulation. Some hand-controlled units feature a squeeze valve and pilot to reduce this problem. Ready made, hand-held, gas-burning flamers are available that put out up to 500,000 BTUs. Vapor torches used for weed control can get as hot as 2,500,000 BTUs (careful, that's hot!). Different torches will produce flames with varying widths and throwing distances. Vapor torches have a limited capacity to handle larger, more established weeds.

Generally more effective are liquid spray torches, which can be hand-held or mounted on a rig. These torches actually spray and ignite **liquid** propane or butane. The propane tank needs to be equipped with a specialized valve to release the liquid fuel. These torches can tackle large plants and shrubs because they generally have wider, longer flames (2 to 6 feet) than gas torches. Water misters can be used to protect non-target plants during treatment. The liquid spray torches have proven themselves quite effective in cultivated settings: they are being used in cotton, grape, alfalfa, and other crops. No information was available as to how effective these tools might be in more natural settings, although brush control was specifically listed as a use for the liquid spray torch.

As we all know, fire is dangerous in our hot, dry California climate. So, play it safe with flamers. Dry season use may not be a good idea in your area. Call your local fire agency before planning any use of fire (i.e., before you buy the equipment...). ❖



Flaming method used in an urban setting

Contacts: **Flame Engineering** 1-800-255-2469 <http://www.gameco.com> manufactures flaming equipment.

Suburban Propane in Fresno assembles and sells Flame Engineering products (559) 486-2770.

Peaceful Valley Farm Supply 1-888-784-1722 <http://www.groworganic.com> sells vapor torches on hand-held and backpack units.

Ace or True Value Hardware stores can order Flame Engineering equipment

BernzOMatic 1-800-654-9011 <http://www.bernzomatic.com> distributes garden-use flamers that fit on camp stove propane canisters.

Minutes of the California Interagency Noxious Weed Coordinating Committee Meeting

American Canyon, CA

January 27, 2000

Agency Reports

California Agricultural Commissioner's Association (CACASA): (1) *Weed Free Forage Program*- Certification plan developed. Committee will meet one more time, Feb 11, to hash out final procedures and how to ID the certified products. Hoping to have BLM and USFS there to consult on implementation and making product available to buyers. Invasive species sold in nursery trade—some are propagating and selling Fed, A- and B-rated weeds. Pest exclusion taking a look to see if there are any regulations that permit such activity. (2) *Invasive Horticultural Species*- Sale of invasive nursery stock—a committee identified 13 species for listing as CA noxious weeds. List turned over to CDFA rating committee and now awaiting response.

Caltrans: Review of pesticide use reduction initiative (see article on page 1).

California Department of Food and Agriculture (CDFA): (1) *AB1176 (Frusetta)* passed legislature and was signed by governor in Sept., but was cut from 500K to 200K, ea year for 3 years. Not clear why; \$30K/yr is for research. An advisory committee is being formed. Will try to get contract out soon. Of remaining \$170k, all goes to WMAs; CDFA will take none; will be administered through CACs. CDFA is working with CACs on how to set up funding process. Now looking at which WMAs seem ready to receive money now. Have identified about 17 potential WMA groups. \$ for pilot projects. Plan will go back to CACs for comment. Funds must be used this fiscal year and treating season is coming on, so process must get underway soon. Seems that AB1176 is being taken as a pilot project by legislature, to see what we can do with money. (2) *YST mapping project*—to ID pioneer populations in the Sierra and create a protection plan. Project will continue this summer; one success story already, Tehachapi area may be able to eradicate YST from that area; success through working with students and realtors. Made a low-cost control program available to landowners. (3) *Mapping conference* on practical use of GPS, GIS, and databases in planning stages (see page 5). (4) *Fort Hunter-Liggett plan*, an excellent 3-5 yr plan had been developed for integrated management of yellow starthistle, but the USFWS may now require further consultation. Could hold up beginning of treatments unless resolved. Main problem is the use of the herbicide. (4) *Purple Loosestrife Calfed Bay Delta Project*- Awarded grant last spring. Going through contracting process now. Starting education campaign this spring and this summer will go full bore on survey. (5) *CDFA Noxious Weed List*- Have been working on expanding list. Most candidates taken from CalEPPC list. After going through process, needs to be improved, especially to expand representation from the scientific community. At

this time, background material needs to be added to package and then it will be sent to the Secretary. What's slowing it down now is that it got embroiled in some questions about changing ratings on some other species already on the list, but these really don't apply and should move on soon. (6) *Salvinia*— Had been sold in nurseries. Found in San Diego River and a pond in Fallbrook—both pops being destroyed. Big infestation is in the Palo Verde ID drain near Blythe, feeding the Colorado River. PVID is going to work with CDFA to eradicate infestation. Also CDFA working with APHIS and ARS for a BC agent. There's an agent is FL that came in with plant, but it was never permitted. Was moved to TX before lack of permit discovered. Will have to be a few minor safety tests done before it can become available.

USDA-Agricultural Research Service: (1) *Biological Control*- Hope to get another \$180K to support host testing for Russianthistle BC; 2 scientists are working full time on exploration for YST and Russianthistle agents. Mostly in Turkey and So. parts of ex-Soviet Union. Have a couple promising agents. Also a root weevil from Italy. Now have about 4 insects under evaluation for YST and 4 for Russianthistle. Also getting a new scientist for the Albany facility. Recruitment is underway now. There is also a pathogen *Puccinia* which is close to being ready for release, but that's been the case for several years now. Hopefully, it will go to APHIS for final approval this spring. There hadn't been any paths approved for release for about 8 years, until two were released last year in Hawaii.

Natural Resource Conservation Service (NRCS): Another source of weed funds—CSU system is getting \$750K/yr to expand ag support. Projects require matching funds, but ¾ can be in kind. Also remember EQIP grants. Presented a brief overview of competition studies on YST, looking for plants that can suppress it. Originally, similar work was done for medusahead in other parts of US. Have found some promising results.

At end of meeting, a discussion broke out on whether we should revisit the CINWCC strategic plan and develop some more action items--- the next meeting will be slated to take up this discussion more fully.

General Business

Department of Pesticide Regulation— report given on surface/ground water issues; issues are heating up. Clean Water Act requires states to ID polluted waterways and develop plan to clean them up. States had been happily identifying waterways but not doing much about them. Suits have forced movement. Supposed to figure out what the problems are, who's responsible, where it's going, and how to get there. State and Regulatory WQCB's getting concerned, especially about direct applications of pesticides to water, even though allowed by label. There are direct conflicts between the pesticide and water quality laws concerning treatments to water, particularly for surface water. There are also issues coming for groundwater. The biggest change is that they've learned that the characteristics of the land are probably just as or more important than the characteristics of the chemical with regard to ground water pollution. They will probably get a larger focus in regulation.

Jim Quinn from the Information Center for the Environment, UC Davis gave an overview of his organization. On weeds, they support two efforts currently, the Noxious Weed Control Project Inventory and the National Biological Interagency Info Infrastructure. Most of their work is with Dept. of Interior especially USGS, and on international issues. Invasive weeds were chosen as a pilot for a large data-sharing project for all of the Americas. Funded by World Bank, also NSF and NAFTA (see article on page 6). Want to produce an on-line mapping capability for occurrences of invasive weeds and an early warning system.

MARK YOUR CALENDARS!!!

Next meeting-
April 18th, 10 AM
Sacramento, CA
(Meadowview Facility)

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Please mail to: CDFA attn: Noxious Times, 1220 N St., Room A-357, Sacramento, CA 95814



K-12 Invasive Species Education Meeting

Working towards a State Education Outreach Campaign

Meeting Overview

Inspired by successful invasive species education campaigns of neighboring states, a meeting focusing on Kindergarten-12th grade (K-12) invasive species education was held in Sacramento on February 3rd, 2000. We heard from many experienced program leaders and learned about their environmental, agricultural, and weed education programs being implemented across the state. The meeting shed light on potential partnerships between existing programs and the invasive species community. Further, the meeting served as a starting point in getting a more coordinated and comprehensive weed education and awareness campaign launched within the State.

K-12 Education Needed at Many Levels

Several avenues of K-12 invasive species education outreach were highlighted. A good deal of outreach can be targeted towards *after school programs* such as, 4-H, boys and girls clubs, Jr. Rangers, and like programs. Another route involves the development of *classroom curriculum based lessons/activities*. Teachers are under extreme pressure to meet rigorous State and National standards. Therefore, the only way to realistically ask teachers to incorporate an additional topic is to create a resource that is easy to implement and that can be used to meet more than just science standards (incorporation into math, language arts, and history standards). Another key to incorporating invasive species focused materials would be to partner with existing programs that already have curriculum in the classroom. *Service Learning* or community service is another avenue of reaching youth. Service learning is being incorporated and increasingly required as a requirement for graduation throughout the state. Invasive species mapping and management projects would be good service learning projects.

First committee forms

A committee is focusing on the development of interpretive trailhead signs for the Park Service and panels for Caltrans rest stops throughout the state. This working group will also develop packets of invasive species materials that can be provided to teachers, Park Service interpreters, and others. Packet will include invasive species fact sheets, brochures, classroom activities, and non-technical articles more easily digestible by kids.

Lots more work to be undertaken- Volunteers?

Other K-12 education committees are needed. A small working group could develop additional support materials- fun activities, coloring books, writing/poster contests, calendars, bumper stickers, and the like. A subcommittee could take on the coordination of developing curricula for use by teachers throughout the state. Yet another committee could conduct outreach to bring more students in on mapping and managing invasive species as a way of fulfilling service learning requirements. Weed Management Area groups can be ideal organizations to reach out to educators in their counties.

K-12 Education is a Valuable Tool

Education is one of our best tools against the spread of invasive species. Kids are our future stewards of California's lands and will be our next generation of voters. Kids get excited about invasive species and draw in their parents, friends, and neighbors. For these reasons, and many more, we will continue to work towards a more comprehensive and coordinated invasive species education campaign for California. ❖

JOIN THE EFFORT!!! To find out how you can get involved, contact Carri Benefield, (916) 654-0768, cbenefield@cdfa.ca.gov

CALTRANS HERBICIDE REDUCTION

An EIR was completed in 1992 for the CALTRANS Vegetation Control Program. The EIR specified a 50% reduction by the year 2000 of active herbicide ingredient compared to that used in the fiscal year 1992/1993. Over the past few years herbicide use had been reduced but was not on target for a 50% reduction by 2000 (or for 80% reduction by 2010). On October 8 1999, CALTRANS District Directors were notified that they would be held to this reduction schedule. This was done to address the concerns of herbicide health issues. The emphasis for reductions would be focused in non-landscaped roadways (90% of inventory: primarily rural areas). In a presentation to the California Agricultural Commissioner's Weed & Vertebrate Control Committee, Mr. Jack Broadbent Senior Landscape Architect at the Office of Roadside Maintenance, detailed that CALTRANS would be reverting to other Integrated Vegetation Control strategies such as mowing. In some cases they will be doing nothing, or pursuing partnerships at the local level.

Upcoming Events:

April 7, 2000

The Biology and Biological Control of Giant Salvinia, *Salvinia molesta*

11 AM Hanna Room, Asmundson Hall, UCD
Talk by Dr. Peter Room from the Division of Entomology at CSIRO in Queensland Australia.

April 18, 2000

CINWCC Meeting

The meeting will be held at CDFA's Meadowview Office Conference Room in Sacramento from 10 AM to 3 PM.

April 22, 2000

Education Field Day Focusing on Exotic Pest Plants

Sponsored by the Western Shasta RCD and the Shasta WMA in Redding. Information will include history, identification, invasive tendencies, threats to native species, control and more. *For more information contact Stuart Gray at (530) 365-4999.*

May 5-7, 2000

California Wilderness Conference

California State University Sacramento
Sponsored by California Wilderness Coalition, Sierra Club, The Wilderness Society, Friends of the River, and the Mountain Lion Foundation among others.

June 16-18, 2000

Jepson Herbarium 50th Anniversary Celebration and Scientific Symposium

Valley Life Sciences Building, UC Berkeley
Aimed at discovery, communication, and conservation of plant biodiversity in California. Activities include talks as well as discussions given by various speakers, botanical field trips and a banquet. Registration deadline is May 19, 2000. *For more information, contact Betsy Ringrose or Staci Markos at (510) 643-7008, email: ringrose@uclink4.berkeley.edu or smarkos@socrates.berkeley.edu Website can be found at www.ucjeps.berkeley.edu/hemicen.html*

July 11-12, 2000

California Conference on Biological Control

Historic Mission Inn at Riverside
Topics will include bio-control as a component in integrated pest management systems, the ecological benefits and risks of classical bio-control, plant biodiversity and the enhancement of bio-control agents, and mass production of natural enemies: taxonomy, quality control, release strategies, and issues relating to genetics. *For more information, call (909) 787-7292, email: ccbc2@cnas.ucr.edu or visit the website at <http://biocontrol.ucr.edu>*

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www.cdfa.ca.gov/noxioustimes

October 3-5, 2000

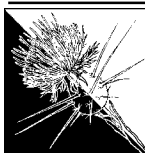
CALFED Science Conference

Conference is hosted by CALFED at the Sacramento Convention Center. It includes a special session about nonnative invasive species. Deadline for abstracts is 6/23/2000. *For more information contact: Heather Bowman at (510) 622-2465. Details can be found at www.iep.water.ca.gov/alfed/sciconf/*

October 6-8, 2000

CalEPPC Symposium 2000

Posters are needed to address all areas of exotic pest plant control in wildland ecosystems for California. Members, colleagues, and students are invited to display their posters and answer any questions during the Poster Session and Social on the first day of the conference. *For more information contact Carri Benefield at (916) 654-0768, cbenefield@cdfa.ca.gov*



CALIFORNIA INTERAGENCY
NOXIOUS WEED
COORDINATING COMMITTEE
NOXIOUS TIMES

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